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☐	L1	mesh same (merg$3 or compress$5) and polygon$1 and edge$1 same length and boundary	28

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		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=OR	
☐	L12	mesh same merg$3 same edge$1 same (adjust or adjusting or adjustment) and boundary and length and size and polygon$1	3
☐	L11	mesh same merg$3 same edge$1 same (adjust or adjusting or adjustment) and boundary and length and size	5
☐	L10	mesh same merg$3 same edge$1 same (adjust or adjusting or adjustment) and boundary and length and size and average	2
☐	L9	L8 and length same average	8
☐	L8	l7 and polygon$1 and size and boundary	51
☐	L7	mesh same merg$3 and edge and adjust$5	1056
☐	L6	mesh same merg$3 and edge and adjust$5	1056
☐	L5	mesh same merg$3 and edge and adjust$5	1056
☐	L4	L2 and mesh same merg$3 and edge and adjustment	1
☐	L3	L2 and mesh same merg$3 and edge same adjust$	0
☐	L2	345/629.ccls.	1010
☐	L1	first same mesh and second same mesh same merg$3 and density and edge$1 same adjust$5 and polygon$1 and size and length	2

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Terms used
mesh same merging same polygon same edge same size same length

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1 The Quadtree and Related Hierarchical Data Structures

Hanan Samet

June 1984 **ACM Computing Surveys (CSUR)**, Volume 16 Issue 2

Publisher: ACM Press

Full text available: pdf(4.87 MB) Additional Information: full citation, references, citings, index terms

2 On randomization in sequential and distributed algorithms

Rajiv Gupta, Scott A. Smolka, Shaji Bhaskar

March 1994 **ACM Computing Surveys (CSUR)**, Volume 26 Issue 1

Publisher: ACM Press

Full text available: pdf(8.01 MB) Additional Information: full citation, abstract, references, citings, index terms

Probabilistic, or randomized, algorithms are fast becoming as commonplace as conventional deterministic algorithms. This survey presents five techniques that have been widely used in the design of randomized algorithms. These techniques are illustrated using 12 randomized algorithms—both sequential and distributed— that span a wide range of applications, including:primality testing (a classical problem in number theory), interactive probabilistic proof s ...

Keywords: Byzantine agreement, CSP, analysis of algorithms, computational complexity, dining philosophers problem, distributed algorithms, graph isomorphism, hashing, interactive probabilistic proof systems, leader election, message routing, nearest-neighbors problem, perfect hashing, primality testing, probabilistic techniques, randomized or probabilistic algorithms, randomized quicksort, sequential algorithms, transitive tournaments, universal hashing

3 Status report of the graphic standards planning committee

Computer Graphics staff

August 1979 **ACM SIGGRAPH Computer Graphics**, Volume 13 Issue 3

Publisher: ACM Press

Full text available: pdf(15.01 MB) Additional Information: full citation, references, citings

4 Voronoi diagrams—a survey of a fundamental geometric data structure

Franz Aurenhammer

September 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 3

Publisher: ACM Press

Full text available: pdf(5.18 MB) Additional Information: full citation, references, citings, index terms

Keywords: cell complex, clustering, combinatorial complexity, convex hull, crystal structure, divide-and-conquer, geometric data structure, growth model, higher dimensional embedding, hyperplane arrangement, k-set, motion planning, neighbor searching, object modeling, plane-sweep, proximity, randomized insertion, spanning tree, triangulation

5 Meshed atlases for real-time procedural solid texturing

Nathan A. Carr, John C. Hart

April 2002 **ACM Transactions on Graphics (TOG)**, Volume 21 Issue 2

Publisher: ACM Press

Full text available: pdf(5.93 MB) Additional Information: full citation, abstract, references, citings, index terms

We describe an implementation of procedural solid texturing that uses the texture atlas, a one-to-one mapping from an object's surface into its texture space. The method uses the graphics hardware to rasterize the solid texture coordinates as colors directly into the atlas. A texturing procedure is applied per-pixel to the texture map, replacing each solid texture coordinate with its corresponding procedural solid texture result. The procedural solid texture is then mapped back onto the object s ...

Keywords: MIP-map, Mesh partitioning, procedural texturing, solid texturing, texture atlas, texture mapping

6 Out-of-core compression for gigantic polygon meshes

Martin Isenburg, Stefan Gumhold

July 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 3

Publisher: ACM Press

Full text available: pdf(3.43 MB) Additional Information: full citation, abstract, references, index terms

Polygonal models acquired with emerging 3D scanning technology or from large scale CAD applications easily reach sizes of several gigabytes and do not fit in the address space of common 32-bit desktop PCs. In this paper we propose an out-of-core mesh compression technique that converts such gigantic meshes into a streamable, highly compressed representation. During decompression only a small portion of the mesh needs to be kept in memory at any time. As full connectivity information is available ...

Keywords: external memory data structures, mesh compression, out-of-core algorithms, processing sequences, streaming meshes

7 Out-of-core build of a topological data structure from polygon soup

Sara McMains, Joseph M. Hellerstein, Carlo H. Séquin

May 2001 **Proceedings of the sixth ACM symposium on Solid modeling and applications**

Publisher: ACM Press

Full text available: pdf(1.22 MB) Additional Information: full citation, abstract, references, citings, index terms

Many solid modeling applications require information not only about the geometry of an object but also about its topology. Most interchange formats do not provide this information, which the application must then derive as it builds its own topological data structure from unordered, "polygon soup" input. For very large data sets, the topological data structure itself can be bigger than core memory, so that a naive algorithm for building it that doesn't take virtual memory access p ...

8 Quality mesh generation in three dimensions

Scott A. Mitchell, Stephen A. Vavasis
July 1992 **Proceedings of the eighth annual symposium on Computational geometry**
Publisher: ACM Press

Full text available: pdf(1.11 MB) Additional Information: full citation, abstract, references, citings, index terms

We show how to triangulate a three dimensional polyhedral region with holes. Our triangulation is optimal in the following two senses. First, our triangulation achieves the best possible aspect ratio up to a constant. Second, for any other triangulation of the same region into m triangles with bounded aspect ratio, our triangulation has size n = O (m). Such a triangulation is desired as an initial mesh for a finite element m ...

9 Triangulating polygons without large angles

Marshall Bern, David Dobkin, David Eppstein
July 1992 **Proceedings of the eighth annual symposium on Computational geometry**
Publisher: ACM Press

Full text available: pdf(1.01 MB) Additional Information: full citation, abstract, references, citings, index terms

We show how to triangulate an n-vertex polygonal region—adding extra vertices as necessary—with triangles of guaranteed quality. Using only O(n) triangles, we can guarantee that the smallest height (shortest dimension) of a triangle is approximately as large as possible. Using O(n log n) triangles, we can also guarantee that the largest angle is no greater than 150° ...

10 Surfaces from contours

David Meyers, Shelley Skinner, Kenneth Sloan
July 1992 **ACM Transactions on Graphics (TOG)**, Volume 11 Issue 3
Publisher: ACM Press

Full text available: pdf(2.04 MB) Additional Information: full citation, abstract, references, citings, index terms, review

This paper is concerned with the problem of reconstructing the surfaces of three-dimensional objects, given a collection of planar contours representing cross-sections through the objects. This problem has important aplications in biomedical research and instruction, solid modeling, and industrial inspection. The method we describe produces a triangulated mesh from the data points of the contours which is then used in conjunction with a piecewise parametric surface-fitting algori ...

Keywords: branching problem, branching surfaces, correspondence problem, meshes, minimum spanning tree, surface fitting, surface reconstruction, tiling

11 A survey of methods for recovering quadrics in triangle meshes

Sylvain Petitjean
June 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 2

Publisher: ACM Press

Full text available: pdf(3.91 MB) Additional Information: full citation, abstract, references, citings, index terms

In a variety of practical situations such as reverse engineering of boundary representation from depth maps of scanned objects, range data analysis, model-based recognition and algebraic surface design, there is a need to recover the shape of visible surfaces of a dense 3D point set. In particular, it is desirable to identify and fit simple surfaces of known type wherever these are in reasonable agreement with the data. We are interested in the class of quadric surfaces, that is, algebraic surfa ...

Keywords: Data fitting, geometry enhancement, local geometry estimation, mesh fairing, shape recovery

12 Models and meshes: Local polyhedra and geometric graphs

Jeff Erickson

June 2003 **Proceedings of the nineteenth annual symposium on Computational geometry**

Publisher: ACM Press

Full text available: pdf(362.08 KB) Additional Information: full citation, abstract, references, citings, index terms

We introduce a new realistic input model for geometric graphs and nonconvex polyhedra. A geometric graph *G* is *local* if (1) the longest edge at every vertex *v* is only a constant factor longer than the distance from *v* to its Euclidean nearest neighbor and (2) the lengths of the longest and shortest edges differ by at most a polynomial factor. A polyhedron is local if all its faces are simplices and its edges form a local geometric graph. We show that any boolean combina ...

Keywords: binary space partition, bounding volume hierarchies, collision detection, realistic input models

13 An optimal bound for conforming quality triangulations: (extended abstract)

Tiow-Seng Tan

June 1994 **Proceedings of the tenth annual symposium on Computational geometry**

Publisher: ACM Press

Full text available: pdf(1.01 MB) Additional Information: full citation, abstract, references, index terms

This paper shows that for any plane geometric graph G with n vertices, there exists a triangulation T conforms to G , i.e. each edge of G is the union of some edges of T , where T

14 Object-based and image-based object representations

Hanan Samet

June 2004 **ACM Computing Surveys (CSUR)**, Volume 36 Issue 2

Publisher: ACM Press

Full text available: pdf(1.05 MB) Additional Information: full citation, abstract, references, index terms

An overview is presented of object-based and image-based representations of objects by their interiors. The representations are distinguished by the manner in which they can be used to answer two fundamental queries in database applications: (1) Feature query: given an object, determine its constituent cells (i.e., their locations in space). (2) Location query: given a cell (i.e., a location in space), determine the identity of the object (or objects) of which it is a member as well as the re ...

Keywords: Access methods, R-trees, feature query, geographic information systems

(GIS), image space, location query, object space, octrees, pyramids, quadtrees, space-filling curves, spatial databases

15 Session 3: Connectivity transformation for mesh metamorphosis

Minsu Ahn, Seungyong Lee, Hans-Peter Seidel

July 2004 **Proceedings of the 2004 Eurographics/ACM SIGGRAPH symposium on Geometry processing SGP '04**

Publisher: ACM Press

Full text available: pdf(472.96 KB) Additional Information: full citation, abstract, references, index terms

In previous mesh morphing techniques, the vertex set and connectivity of an in-between mesh are fixed and only the vertex positions are interpolated between input meshes. With this restriction, to accurately represent both source and target shapes, an in-between mesh should contain a much larger number of vertices than input meshes. This paper proposes a novel approach for mesh morphing, which includes connectivity changes in a metamorphosis. With the approach, an in-between mesh contains only t ...

16 A unified approach for simplifying polygonal and spline models

M. Gopi, D. Manocha

October 1998 **Proceedings of the conference on Visualization '98**

Publisher: IEEE Computer Society Press

Full text available: pdf(1.47 MB) Additional Information: full citation, references, citings, index terms Publisher Site

Keywords: dynamic tessellation, levels-of-detail, model simplification, spline patches, surface approximation, surface fitting

17 Shape analysis: Fair morse functions for extracting the topological structure of a surface mesh

Xinlai Ni, Michael Garland, John C. Hart

August 2004 **ACM Transactions on Graphics (TOG)**, Volume 23 Issue 3

Publisher: ACM Press

Full text available: pdf(1.34 MB) mov(26:11 MIN) Additional Information: full citation, abstract, references

Morse theory reveals the topological structure of a shape based on the critical points of a real function over the shape. A poor choice of this real function can lead to a complex configuration of an unnecessarily high number of critical points. This paper solves a relaxed form of Laplace's equation to find a "fair" Morse function with a user-controlled number and configuration of critical points. When the number is minimal, the resulting Morse complex cuts the shape into a disk. Specifying addi ...

Keywords: Morse theory, atlas generation, computational topology, surface parameterization, texture mapping

18 Quadric-based simplification in any dimension

Michael Garland, Yuan Zhou

April 2005 **ACM Transactions on Graphics (TOG)**, Volume 24 Issue 2

Publisher: ACM Press

Full text available: pdf(16.40 MB) Additional Information: full citation, abstract, references, index terms

We present a novel generalization of the quadric error metric used in surface simplification that can be used for simplifying simplicial complexes of any type embedded in Euclidean spaces of any dimension. We demonstrate that our generalized simplification system can produce high quality approximations of plane and space curves, triangulated surfaces, tetrahedralized volume data, and simplicial complexes of mixed type. Our method is both efficient and easy to implement. It is capable of processi ...

Keywords: Quadric error metric, curve simplification, edge contraction, surface simplification, volume simplification

19 Models and meshes: Anisotropic voronoi diagrams and guaranteed-quality anisotropic mesh generation

Francois Labelle, Jonathan Richard Shewchuk

June 2003 **Proceedings of the nineteenth annual symposium on Computational geometry**

Publisher: ACM Press

Full text available: pdf(423.41 KB) Additional Information: full citation, abstract, references, citings, index terms

We introduce *anisotropic Voronoi diagrams*, a generalization of multiplicatively weighted Voronoi diagrams suitable for generating guaranteed-quality meshes of domains in which long, skinny triangles are required, and where the desired anisotropy varies over the domain. We discuss properties of anisotropic Voronoi diagrams of arbitrary dimensionality---most notably circumstances in which a site can see its entire Voronoi cell. In two dimensions, the anisotropic Voronoi diagram dualizes to ...

Keywords: anisotropic Voronoi diagram, anisotropic mesh generation

20 Session P12: approximation and compression: Compressing large polygonal models

Jeffrey Ho, Kuang Chih Lee, David Kriegman

October 2001 **Proceedings of the conference on Visualization '01**

Publisher: IEEE Computer Society

Full text available: pdf(457.99 KB) Publisher Site Additional Information: full citation, abstract, references, citings, index terms

We present an algorithm that uses partitioning and gluing to compress large triangular meshes which are too complex to fit in main memory. The algorithm is based largely on the existing mesh compression algorithms, most of which require an 'in-core' representation of the input mesh. Our solution is to partition the mesh into smaller submeshes and compress these submeshes separately using existing mesh compression techniques. Since a direct partition of the input mesh is out of question, instead, ...

Keywords: compression algorithms